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A panel of regional indicators of labour market flexibility: the UK, 1979-1998

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Abstract

Despite the centrality of the issue of labour market flexibility for policy and academic research, attempts to consistently measure levels of flexibility, either within or across countries, have been remarkably scarce. This paper presents a complete set of labour market flexibility indicators for the UK and its regions over the period 1979-1998, based on survey-data sources and relating directly to theoretical considerations existing in the literature. After discussing issues related to the measurement of flexibility and the construction of the indexes, we examine the evolution of labour market flexibility and its various forms, across the UK regions and over the twenty-year period of our study. This examination reveals a number of interesting findings: labour market flexibility increased throughout the period across all UK regions, but specific elements of flexibility have followed divergent and non-linear trends; evidence of convergence in the regional levels of flexibility co-exists with a rather persistent pattern of a North-South dichotomy and regional specialisation in different forms of flexibility; if anything, deregulation does not seem to have facilitated regional harmonisation in levels and forms of labour market flexibility.

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I. Introduction

It is a widely held view that labour market flexibility has advanced over the last two decades in many OECD and other economies. Indeed, the 1980s experienced a global shift of economic policy towards the relaxation of the rigidities imposed in the labour and product markets over the period of Keynesian regulation and Fordist development. This underlined the belief that market forces, when left free to operate, can lead to optimal economic (but also social) outcomes and that policy intervention can only distort the market clearing equilibria, thus generating unemployment and lowering the rates of economic growth. Under such considerations, a number of measures were introduced (or relaxed) in many countries to facilitate the flexibilisation of their labour markets. Despite this, and the voluminous research into its economic impact, little effort has been put in producing consistent measures of flexibility.[1] Rather, flexibility is assumed to increase each and every time deregulation occurs, despite wide recognition that the former is conditioned on a range of factors outside regulation and, thus, should not be equated with deregulation (see Pollert, 1991, or Solow, 1998, for a theoretical discussion and Addison and Hirsch, 1997, for relevant empirical evidence).[2] As a result, little is known empirically about the levels (let alone the specific forms, spatial variation or temporal evolution) of flexible labour relations that actually obtain in the labour market.

[1] Among the few relevant attempts (always at the national scale), the ILO and the OECD indexes (for example, ILO, 1999; OECD, 1997) are the most detailed and consistent over time, although they lack reference to theory. Some researchers have used single-year small-scale survey data to quantify flexible employment relations, but the measures produced are not comparable across studies or over time (see for example Burchell et al., 1999, based on the Job Insecurity and Work Intensification Survey). Finally, since 1998 the ONS produces a relatively consistent indicator of flexible forms of employment based on QLFS data. This indicator is closely related to the more detailed indexes presented in this paper.

[2] Following this consideration, a distinction is employed throughout, between deregulation (the implementation of policies aiming at enhancing flexibility) and flexibility (the actual conditions created as a response to deregulation). In another part of the work where this chapter is based (Monastiriotis, 2002), I derive a labour market model which makes flexibility endogenous to the fundamentals of the labour market, as well as to levels of regulation.

The UK in particular experienced a significant shift away from the government protectionism regime of the 1970s (for political as well as economic reasons), and is in many respects one of the most characteristic examples of labour market deregulation. During the 1980s Thatcherism provided the political and ideological platforms for the deregulation of labour relations and the flexibilisation of the UK labour markets. The trend towards labour market deregulation continued (and in some cases, intensified) in the following Conservative and, more importantly, the new Labour governments (Work and Parents Taskforce, 2001; OPSR, 2002). From the beginning of the 1980s, the 1980 Employment Act imposed restrictions on the rights to strike and to organise in a trade union and removed some of the benefits related to unfair dismissal and maternity rights. At the end of the decade, the 1989 Employment Act further restricted such rights and imposed clauses that reduced job and employment security (dismissal protection and redundancy payments). Although the 1993 Trade Union Reform and Employment Rights Act re-defined or re-introduced some of the employment rights related to maternity leave and dismissal protection, the same act completely abolished the Wage Councils responsible for the determination of minimum levels of pay (although only for overtime and hourly wage rates and for only a few occupations, since the 1986 Wage Act). More recent Employment Acts (e.g., 1996, 1999) have re-introduced some of the previously removed employment rights (e.g., re-introduction of a national minimum wage and restrictions introduced over the length of the working day and week). Nevertheless, labour market flexibility remains central for policy.

The policies employed to enhance labour market flexibility did never obtain a clear regional dimension. Even in 1999, with the introduction of the new minimum wage, labour market policy did not assume a regional dimension, despite the recognition of at least some academics that this might be necessary (Sunley and Martin, 2000) and the known differences in incomes and average wages among some UK regions (especially the South East and the

rest of the country) (Gregg and Machin, 1994). Of course, this probably reflects the belief that nation-wide labour market policies can have regionally uneven effects rather than a neglect of the regional economic problems of the country.[3] Such effects can mainly arise from cross-regional differences in the implementation of the deregulation policies. In turn, these differences will depend on a number of region-specific factors that will determine the way in which each region will respond to any uniform (i.e., national) deregulation policy.

Acknowledging the possibility of regional differences in labour market flexibility, the purpose of this paper is twofold. First, to construct a series of measures that would reflect the extent of flexible arrangements in the UK labour market, over two decades of significant regulatory and economic changes. Second, to derive such measures at the sub-national (regional) level and examine spatial patterns of differentiation and clustering. The next section makes some theoretical considerations that help identify the elements that comprise labour market flexibility. Section III discusses the empirical issues relating to the quantification of these elements into cardinal indexes. Section IV examines the evolution over time and across space of the constructed indexes. The last section concludes with some considerations for policy.

II. Labour market flexibility and its elements

Defining labour market flexibility as the extent to which labour market forces determine labour market outcomes, it follows that a totally flexible labour market is one where no financial, institutional, linguistic, political and cultural impediments (or indeed any impediments) are present. In this respect, any factor entering the labour market other than the forces of demand and supply -themselves determined by the profit and utility maximising

[3] From this viewpoint, it has been argued that labour market deregulation constituted an indirect regional economic policy (Armstrong and Blackaby, 1998), at least in the 1980s.

economic agents and their preferences-, potentially impose rigidities in the labour market and lead to labour market inflexibilities.

(i) Defining labour market flexibility

Although under this definition, there are many factors that can be related to labour market rigidities, by far the most prominent is labour market regulation, not only for ideological reasons, but also practically, as government regulations are particularly binding and, more importantly, insensitive to labour market and general economic conditions. Because of this -and under the specific conditions that were created after the slowdown of economic growth in the 1970s- labour market deregulation became an issue with many advocates and few opponents. The policies that were developed following that related to the flexibilisation of the housing and financial markets and the reduction of barriers to geographical mobility, but more importantly, to the relaxation of policies that keep minimum wages, hiring and firing costs, costs related to overtime and non-wage compensations (maternity leave, paid holidays, sick leave, etc) and unemployment benefits at high levels.[4]

Nevertheless, following from the above definition, labour market flexibility cannot be simply reduced to the absence of government-imposed regulations in the labour market. One has to keep in mind that often such regulations are not simply introduced to protect workers, but mainly to organise the operation of labour markets in a systematic way, to achieve continuity, and to establish commonly accepted "rules of the game" which should benefit both employees and employers.[5] Moreover, they often serve the goal of neutralising the impact of

[4] It has to be noted, though, that labour market deregulation constitutes effectively a re-regulation of labour markets under more flexible and (mainly) cost-effective rules (Streeck, 1989; Peck, 1992). It is thus conceptually different from labour market flexibility and not at all symmetrically opposite to labour market regulation.

[5] For example, regulations on working times reflect the socially acceptable standards with respect to work intensity, working time and health and safety. Minimum wages reflect the minimum "acceptable" compensations (minimum value the society gives to an hour's work). Unemployment benefits provide incomes for those temporarily out of employment and probably help sustain product demand or at least stabilise it over the business cycle.

other sources of labour market rigidity, e.g., the existence of market power from the side of firms or individual employees. It is well known that firms' monopsony power produces inflexibilities and sub-optimal outcomes in terms of employment, output, prices and wages. The same may be true for some types of labour monopoly power, as has been shown for example in the insider-outsider literature (Lindbeck and Snower, 1988). Because of the presence of such "inflexibilities", it follows that one cannot simply equate labour market deregulation with what could be called "labour market flexibilisation".[6] Indeed, deregulation is neither a sufficient nor a necessary condition for flexibilisation to occur, as flexibility can increase without a change in regulation (for example if other labour market rigidities are removed), while on the other hand deregulation can occur without subsequent changes in observed levels of flexibility (Brosnan and Walsh, 1996; Ozaki, 1999).[7]

Reflecting these considerations, we prefer to think of flexibility more as an outcome, rather than a potential. Such a perspective suggests that labour market flexibility is endogenous to labour market conditions, so that it is not the potential for flexible employment arrangements that is important, but rather the extent to which such flexible arrangements are identifiable in a labour market. The latter will depend on the degree of regulation and the specific economic conditions prevailing in the labour market and will affect the extent to which regulations are used. This is the perspective we employ in what follows, both in terms of the construction of the measures of flexibility and of the analyses of these measures.

[6] Although the term "flexibilisation" is a neologism that is not particularly appealing aesthetically, we use it extensively to describe "increases in labour market flexibility".

[7] Imagine for example that, certain rules regulating fringe benefits were withdrawn (deregulation). Firms would have the option to reduce their fringe benefits in order to reduce their (labour) costs. If, however, such a reduction led to lower labour supply or to reduced workers' effort (probably in an efficiency wages rationale), it is possible that this could reduce production efficiency and output. A profit-maximising firm would possibly find it more profitable to keep its fringe benefits at their pre-deregulation levels, rather than reduce them. Addison and Hirsch (1997) discuss such an empirical case with respect to mandatory advance dismissal notices.

(ii) Types of flexibility

It follows from the above discussion that labour market flexibility is neither uniform nor homogeneous. Instead, it is a composite aggregate, with elements that can often move in opposing directions. The literature introduces a number of typologies that help identify particular elements of flexibility (Atkinson, 1984; Pollert, 1991; Dawes, 1993; Osaki, 1999; Burchell et al., 1999; Weiss, 2001). Such typologies consider different characteristics of the constituent elements of flexibility, for example, their function, their aims, their areas of influence, or the particular forms that they take in the labour market.

Starting from a rather abstract viewpoint, a first decomposition of flexibility can be made along two axis: one measuring numerical versus functional flexibility (or, "tactical" versus "operational"; Weiss, 2001) and a second measuring internal versus external flexibility.[8] This two-way decomposition produces four distinct functional types. The first type, internal numerical flexibility, refers to the adjustability of labour inputs already employed by the firm. It includes the adjustability of working hours (short shifts, overtime) working time (weekly hours, variable shifts), and leave and holidays. In contrast, external numerical flexibility represents the adjustability of the labour intake from the external labour market. It is thus related to temporary and part-time employment, the relaxation of hire-and-fire regulations and increased wage flexibility. The third type, internal functional flexibility, can be defined as "the ability of companies to improve their operating efficiency by reorganising the methods of production and labour content (multiskilling, decreases in job demarcations, increased employee involvement) in order to keep pace with changing [demand conditions or] technological needs" (Koshiro, 1992, p.14). Finally, external

[8] This classification resembles that produced by the Institute of Manpower Studies (Atkinson, 1984; Meager, 1985; Atkinson and Meager, 1986). There, however, functional flexibility was mostly identified as internal, while numerical flexibility was considered external. A third type of financial flexibility, which here we consider external to the labour market and do not discuss, was also identified.

functional flexibility captures the ability of firms to externalise or diversify parts of their production (vertical disintegration), mainly through sub-contracting.

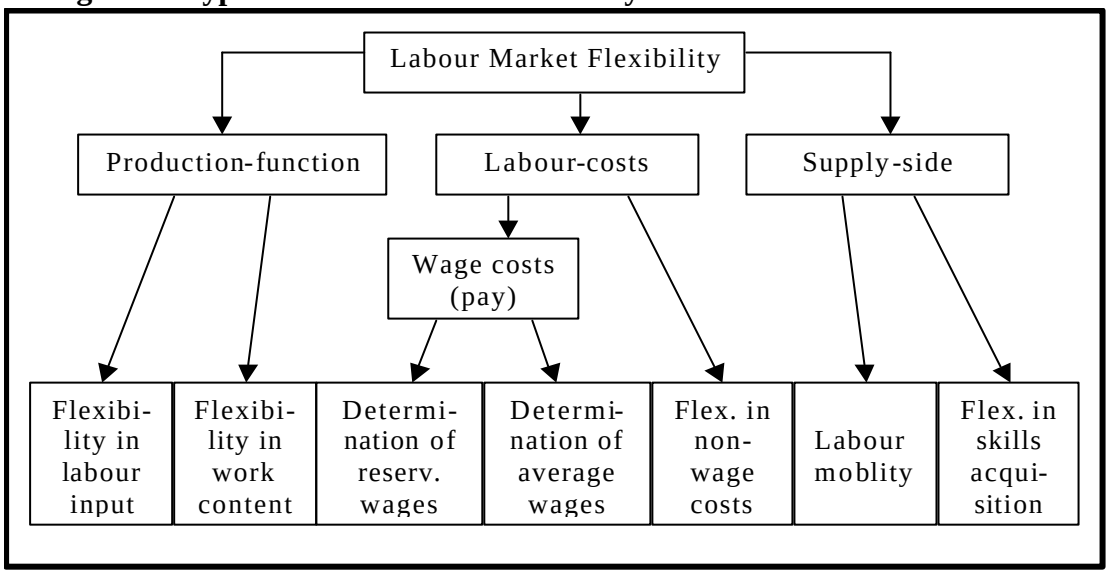
A more empirical perspective would consider labour market flexibility as the extent to which market forces are allowed to operate freely in three broad domains: "production function flexibility", "labour costs flexibility" and "supply-side flexibility"[9], with each of these consisting of smaller sub-domains. Thus, production-function flexibility includes "flexibility in the labour input" (adjustability of labour input to changing economic conditions) and "flexibility in the work content". Correspondingly, labour-costs flexibility includes "flexibility in non-wage costs" and "pay flexibility". Two distinct elements can be further identified within the latter: "flexibility in the determination of reservation wages" and "(average) wage flexibility". Finally, supply-side flexibility can be split into "labour mobility" and "flexibility in skills acquisition".

As illustrated in Figure 1, this typology arrives at seven distinct areas of flexibility. Such a typology is broadly related to two other dimensions, those of the aims and of the sources of flexibility. In terms of sources, flexibility can come from the side of the government, trade unions, employers, or the individual workers (Ozaki, 1999). Specifically, it can be the outcome of changes in the organisation of production and the micro-economic behaviour of firms (e.g., demand for temping or sub-contracting). It can be related to changes in labour market institutions and the governance and macro-operation of labour markets, for example, changes in unemployment benefits, or the responsiveness of wages to changes in unemployment. Finally, it can be the outcome of changes in behavioural patterns from the side of employees (e.g., voluntary sift-working) and the provision of employment policies (e.g., government training programmes). Similarly, flexibility can be purely aiming at

[9] Alternatively, these domains have been labelled "institutional flexibility", "wage flexibility" and "individual flexibility" (Dawes, 1993).

reducing labour (and production) costs (cost-reducing role), or targeting efficiency increases and a higher responsiveness to a more volatile product demand (efficiency-enhancing role), or finally aiming at increasing labour and total factor productivity in the workplace (productivity-increasing role).

Figure 1: Types of labour market flexibility



It is clear from the above considerations, that there is no direct correspondence between the areas presented in Figure 1 and the various sources and targets of flexibility, or indeed the functional types identified earlier. Rather, each of the seven areas can be to varying degrees influenced by the behaviour of firms, unions, the government, or individuals, as well as it can be serving different objectives (e.g., cost-reduction and productivity increases). Similarly, each of these areas includes elements of functional, numerical, internal, and external flexibility. As an example, labour can move within (internal) or between firms (external) and across occupations (functional) or labour markets (numerical). Thus, depending on the level of detail that one seeks, it is possible to identify probably a very large number of types of labour market flexibility. Instead of pursuing such a detailed analysis, the next sub-

section considers directly the various elements of labour arrangements that are empirically observable in the labour market and can be associated to labour market flexibility.

(iii) Observable components of flexibility

There is a plethora of practical examples of flexible labour arrangements in the labour market, many of which existed well before the issue of flexibility obtained its contemporary prominence. In this respect, it is the extent and, more importantly, the ways such arrangements are used that places them in the heart of the debate about labour market flexibility. To review the most widely recognised of those, it is useful to organise them into a number of aggregate groups.

The first group consists of non-standard employment arrangements that allow firms to hire workers while avoiding a permanent commitment to them (and the related non-wage costs). Elements included in this category of "flexible employment" are part-time work (especially when related to a fixed task), temporary placements (either fixed-term contracts or contracts over a fixed task), seasonal work, and casual employment (irregular or occasional work and home-working).[10] These non-standard employment arrangements also connect to elements related to the "casualisation of employment", with the deregulation of dismissal protection (job security). Such elements make the permanency of a job less secure and dismissals less costly. Consequently, labour becomes cheaper (lower non-wage costs) and therefore more responsive to demand and general economic conditions.

The second group, described by the ILO as "working-time flexibility" (Osaki, 1999), reflects the ability of firms to adjust their internal labour input relatively costlessly. It is thus

[10] It has to be noted that, especially in the UK, part-timing has often characteristics more closely related to the internal numerical element. However, we decided to classify part-timing as an external numerical flexibility element, in a sense to avoid double-counting, since largely the "internal" aspects of part-timing can be captured by elements like overtimes and irregular working hours. Instead, we assigned higher significance to "external" elements such as dismissal costs and employee representation rights.

related to labour-input and internal numerical flexibility and includes, among others, flexible working hours, shift-work and use of overtime work. Hence, the relaxation of regulations covering (paid and unpaid) overtimes, working maxima (regarding hours per week, hours per day, or days per week), the continuity of the working day (shift-work) and of the working week (weekend-working) allows firms to adjust internally their labour inputs and distribute them more evenly, so as to achieve continuity of production and respond immediately to demand changes. An example of such an arrangement would be the annualisation of working time, with which overtime is no longer calculated on a weekly basis and weekly hours can vary substantially, sometimes including a week's holiday per month in return for weekend work or longer workdays.

A third group of flexible labour arrangements relates to the "content of work", which includes arrangements on multi-tasking, team-working, broadened job definitions, and within-job occupational mobility. Next, is a broad category of "flexibility in labour standards", which includes elements that largely represent extra production costs, but also aspects related to the adjustability of the labour input. Elements that fall into this broad group are arrangements on employee representation rights, working conditions, health and safety regulations, the right to organise in a union, as well as arrangements on holidays, (sickness or maternity) leave, work-breaks, and working hours.

Two other groups of flexible labour arrangements represent what was earlier framed as supply-side flexibility. These are "flexibility in worker training", including active labour market policies and arrangements about formal education and job-related training, and "flexibility in labour mobility", which captures the propensity of workers to move across occupations, sectors, regions, or simply jobs (and, thus, also includes the average length of job tenure). Finally, the last group identified relates to "pay flexibility". This includes wage flexibility (the elasticity of wages with respect to unemployment), arrangements that

determine the levels and coverage of minimum wages and unemployment benefits, the structure of wage bargaining and union power (including the structure and coverage of the union movement, as well as levels of co-ordination between and among unions and employers and the degree of centralisation or individualisation in the wage bargaining process), but also payroll taxes, which affect the distance between production and consumption wages (the "wedge").

It has to be noted that the groups considered here and the arrangements each group includes are not exclusive. Rather, significant overlapping exists among groups, in the same way as the latter do not correspond directly and exclusively to specific flexibility types, as discussed earlier. However, the consideration of the above list of flexible labour arrangements, and of their types and groupings, is essential in that it facilitates the organisation of the analysis that follows. Hence, following the discussion in the present section, it is possible to move next to the empirical focus of the paper and consider the construction of a series of measures of labour market flexibility for the UK and its regions.

III. Construction of the indexes of flexibility

Clearly, there is a substantial qualitative element in the arrangements under consideration. However, quantification is not the main problem; in the construction of the measures of flexibility severe limitations are imposed by data availability. The UK has a significant number of data sources, available for sufficiently long time-periods, and is thus one of the least problematic cases in this respect. We discuss the data sources and technical details about the index construction process later in this section. However, in order to keep reference with the proceeding theoretical considerations, we start by presenting the various indicators that was possible to construct. These indicators reflect –in the best possible way– the types and groupings of flexible labour arrangements that were presented earlier. As it can

be seen, these indicators were developed in a multi-layer process. Thus, first, we produced measures of the various observable elements of labour arrangements that are generally associated with flexibility. Then, we aggregated them into groups, and then further into functional types. These grouped indexes are presented next (see also Table 1, which presents the full list of indexes and their data sources). The last layer is the aggregate index of overall labour market flexibility, which reflects the average level of flexibility in the UK labour market(s).

(i)The indexes constructed

The first index measures **internal numerical** or **working-time flexibility** and includes four components: *work-time* (the share of employees who are happy with their weekly hours of work and would not prefer to work much more or much less than their actual hours for the going wage rate); *irregular hours* (average of (i) the share of employees working variable hours, (ii) the share of average weekly overtime to average weekly standard hours, and (iii) the share of unpaid to total overtime); *shift-work* (the percentage of employees doing shifts); and *weekends* (the percentage of employees working during weekends). The second index refers to **flexible employment** or **external numerical flexibility** and includes *part-time* (average of (i) the share of part-time to total employment and (ii) the share of involuntary to total part-timing), *temping* (average of (i) the share of temps to total employment and (ii) the share of involuntary temps to total temporary employment), *dismissal* and *employment protection*, *home-working* and *alternative workers* (occasional and seasonal work). Due to data limitations, the last four components were impossible to quantify in a meaningful way and are thus not represented in the index.[11]

[11] This implicitly introduced the assumption that elements/groups within a functional type follow largely the same temporal and spatial patterns. Clearly, such an assumption is restrictive, as it is possible that within the same functional type various elements will be used with variation over time and across labour markets.

Table 1: Indexes of labour market flexibility

Flexibility Indicators			Data Sources			
Basic indexes	**Intermediate indexes**	**Aggregate indexes**	**LFS**	**WIRS**	**FES/ GHS**	**ONS/ OECD**
Work time	Internal numerical	Production function	·	·		
Irregular hours			·			
Shift work			·			
Weekend-work			·			
Home-working	External numerical		*	*		
Alternative workers				*		
Part-time workers			·			
Temporary employment			·			
Dismissal protection			*	*		
Employment protection				*		
Within-job occ. mobility	Internal functional		·			
Empl. representation rights				*		
Labour standards				*		
Multi-tasking				*		
Replacement rate	Unemploy-ment flexibility	Labour costs			·	·
Minimum wages			*			*
Duration of benefits						*
Structure of wage bargaining	Wage flexibility			*		
Co-ordination (unions-firms)				*		
Wage elasticity					·	
Union density	Union Flexibility		·	*		
Union coverage				*		
Union power				*		
Regional mobility	Labour mobility	Supply side	·		·	·
Sectoral mobility			·			
Occupational mobility			·			
Job mobility / Tenure			·			
Housing flexibility					·	
Training	Skills-input flexibility					*
ALMPs						*
Educational attainment						*

Notes: Dots (·) show a valid data source, used in the construction of the corresponding indicator. Stars (*) correspond to potential data sources that, for various reasons (sample size, accuracy, change in definitions over time, regional detail, etc), we were unable to use.

Similar data-related problems were encountered in the construction of the index for **work-content** or **internal functional flexibility** and in particular in the case of *employee representation rights* (the extent of workers' involvement in decision-making), *labour standards* (general working conditions) and *multi-tasking*. Thus, the only component included in this index is *within-job mobility*, measured as the number of employees who changed

occupation over the last year while remaining with the same employer, as a share of all the employees who changed occupation in the same period.[12]

As with internal functional flexibility, many of the elements related to labour-cost flexibility were impossible to obtain for a reasonably large number of observations. This was the case for *minimum wages*, average *duration of unemployment benefits*, and the *structure of wage bargaining* (labour market co-ordination, union coverage and union power). However, three indexes were possible to calculate. Thus, **unemployment flexibility** was calculated on the basis of information on *replacement ratios* (the share of the representative[13] unemployment benefit to average wage). **Wage flexibility** is based on the estimated *wage elasticity* of unemployment (see Appendix 1 for details), while **unionism** (or **wage bargaining flexibility**) is proxied by the inverse of *union density* (the share of employed union-members to total employment).[14]

Data on **labour mobility,** the seventh index, were in general much easier to obtain. *Regional mobility* is the share of gross migration flows to regional population, adjusted for the five-year average unemployment rate (to control for business cycle effects). *Sectoral (occupational) mobility* is the number of employees who changed industry (occupation) over the last year as a share of the total number of employees who changed job during the same period. *Job mobility* is an indicator measuring the average employment length in the region (in 8 intervals), adjusted for regional unemployment. *Housing flexibility*, finally, is the share of employees who changed address for a job-related reason to total employment, again, adjusted for regional unemployment. Following the theoretical discussion, a last index would

[12] This variable has been adjusted for the business cycle, using the regional unemployment rate.
[13] We use the word "representative" here to show that the average unemployment benefit (derived from OECD data on national unemployment benefit replacement ratios) was adjusted for the household composition of the "average" unemployed person (based on information derived from the Family Expenditure Survey series).
[14] Regional union density data are not available prior to 1989. For this reason an extrapolated series of union density was constructed for the period 1979-1998, using data on union recognition from WIRS80 and WIRS84, data on union membership from WIRS84, WIRS90, LFS89-91 and QLFS92-98 and national union density data.

measure flexibility in the **skills input**, based on the three elements of supply-side flexibility (*training, educational attainment* and *active labour market policies*). However, none of these were possible to quantify for a sufficiently large part of the sample and thus this element of flexibility is not included in the analysis.

Following the classification of Figure 1, a further set of three composite indexes was constructed on the basis of the indexes described above. These indexes are: (i) **production function flexibility**, which includes labour-input flexibility and flexibility in the work content and is proxied by the indicators reflecting internal, external, numerical and functional flexibility; (ii) **labour cost flexibility**, which includes wage flexibility, unemployment flexibility, and union flexibility, thus capturing practically only the wage element of the broad labour costs category of Figure 1; and (iii) **supply-side flexibility**, which includes all the elements of labour mobility. These three indexes were finally integrated into one composite index of **labour market flexibility**, capturing the overall picture of flexibility in the labour market. The technical details of the index construction and the aggregations made are discussed next.

(ii)Technical details

In order to collect the necessary information for the construction of these indexes, a large number of available data-sources were used. The primary data source was the Labour Force Survey series (LFS and QLFS). This is a national quarterly (biannual for 1973-1983, annual for 1984-1991) household survey under the responsibility of the Office for National Statistics (ONS). Additional sources were the Family Expenditure Survey (FES) and the General Household Survey (GHS) series, as well as the various Workplace Industrial Relations Surveys (WIRS 1980, 1984, 1990; New Workplace Industrial Relations Survey, 1990; Workplace Employee Relations Survey, 1998). Finally, some published data were also

used, mainly derived from the ONS Regional Trends database, the OECD Database on Social Expenditures and the OECD Employment Outlook series. With this information we achieved the construction of a large panel of 240 observations (12 regions for 20 years), for seven operational aggregate labour market flexibility indicators, measured in percentage points from their maximum value.

The nature of the data sources (surveys), with their frequent changes in the content of the questions asked, made it particularly difficult to obtain consistent time-series for all the indicators. For this reason, in certain cases some data had to be estimated by interpolation. When this was necessary, the typical procedure was to estimate group averages for the data from years where the relevant information was available, and then calculate the values for the year of interest, assuming that the distribution of characteristics across the groups had remained (relatively) constant.

For example, data on household relocation for job-related reasons at a regional level were not available for the years 1980-1983 and 1985. To estimate the missing values, we calculated average relocation rates by region, sector and occupation for the years for which all information was available (e.g., 1979, 1984) and interpolated the household relocation shares for the missing years using national information on relocation rates and on regional, sectoral and occupational employment. This implied the assumption that the share of people moving house for job-related reasons in a region relative to the national share, given differences in the sectoral and occupational composition of employment, remained constant between two years (say, 1979 and 1980). Such an assumption, although restrictive, is not implausible.

Out-of-sample projections were also used when a change in definitions (for the survey data) made the derived indicators non-comparable through time. For example, the figures for sectoral mobility derived from the Quarterly Labour Force surveys were not directly comparable to those derived from the annual Labour Force surveys, because the definition of

job mobility (the control variable) changed between the two survey series. In adjusting the two series we made the assumption that job mobility followed the same trend before and after 1992, relative to the unemployment rate. When inter- and extra-polation was not possible (or did not seem reliable), we had to accept a reduction in the sample size for the specific indicator. This was the case with a few indicators for values before 1982 (for example, information on irregular hours, weekend-work and shift-work) and for household relocation for job-related reasons for values after 1991.

In constructing the indexes, an important decision that had to be made was whether they should be weighted (and how). Admittedly, many of the indicators used exhibit cross-industries and cross-occupational variation. But should such variation be considered endogenous (and, thus, controlled for) to labour market regulation? In other words, are flexible labour markets such because of the firms that operate in them (i.e., is flexibility exogenous to the labour market), or are flexibility-type firms locating in flexible labour markets (endogenous)? For example, is temporary employment more common in London because of its large share of service sector employment (which also attracts a lot of temping), or is it that service sector firms tend to be attracted by London because of its flexible labour market? The decision that was approved was to control most of the indicators for industrial composition, but not for occupational composition, as the latter is much less exogenous to labour market flexibility than is the former. We also made some adjustments based on the regional unemployment rates (deviations from the regional means) for those indicators for which the literature suggested that they depend on the business cycle (for example, household relocation and within-jobs occupational mobility –see Evans, 1999).

A second important issue related to the aggregation of the detailed components and the construction of the broad indexes. Since no prior knowledge could be assumed regarding the significance of each element for the broader category to which it belonged, we did not

weight the indicators when aggregating them. This should not be much of a problem. A potential source of serious bias, however, was in cases where some data were not available for all years (for example, temping in the case of external numerical flexibility). To calculate an unbiased measure of external numerical flexibility, given the missing values for temping and the fact that the constituent elements (temping and part-timing) were not necessarily correlated with one another, we applied a weighted extrapolation procedure, as described in Appendix 2.

IV. Labour market flexibility in the UK, 1979-1998

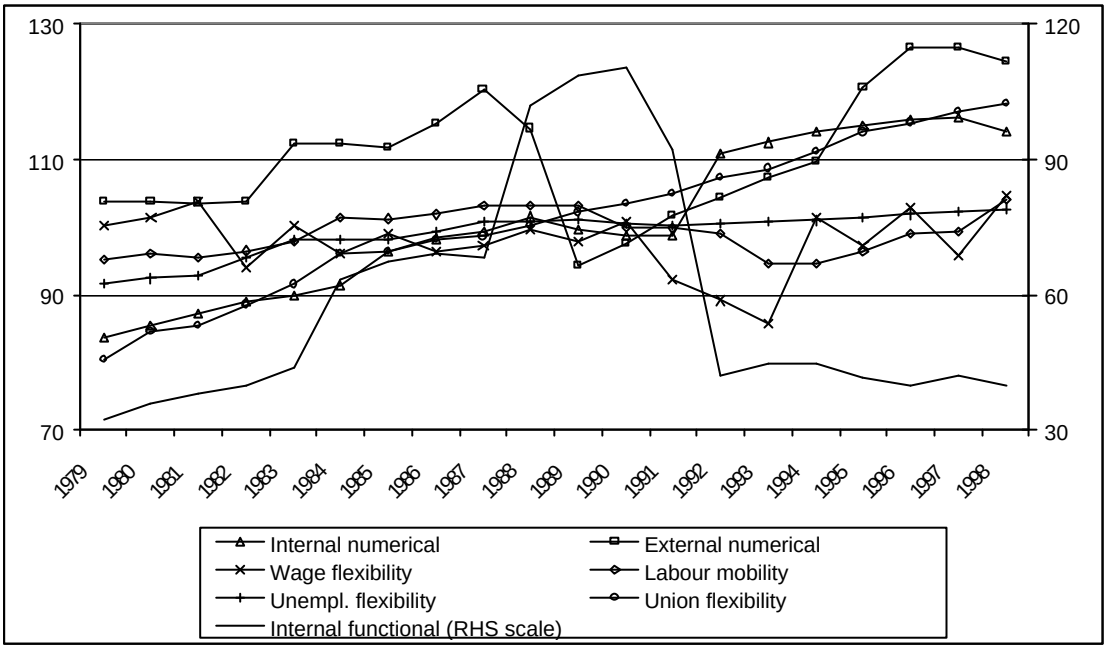
(i) Evolution over time – the national picture

The set of labour market flexibility indicators that was produced based on the above procedures and considerations, despite probably their inherent limitations, allows for a first time a detailed examination of the evolution of labour market flexibility in the UK. As stated earlier, this is particularly important since the UK is probably the country where one of the most intensive labour market deregulation programmes was applied, especially in the 1980s.

Figure 2 plots the temporal evolution of the seven functional indexes of flexibility for the period 1979-1998. A very interesting observation can be made straightaway: the evolution of the different elements of labour market flexibility exhibits significant variability. Indeed, correlation between the indexes varies between –0.36 (internal functional against external numerical) and 0.97 (internal numerical against union flexibility). Internal numerical and union flexibility exhibit an almost linear increase throughout the period, increasing by 36% and 47% in the twenty years between 1979 and 1998, respectively. Unemployment flexibility has also followed a linear-like increase (especially in the 1980s, as it seems to have stabilised in the 1990s), but at a rather slow pace, at 12% in the twenty-year period. External numerical flexibility followed a rather similar trend, but with a significant structural break in the late

1980s, which seems to be related more to the business cycle than to changes in the regulatory framework affecting part-timing and temping. Probably also related to the business cycle is the evolution of the labour mobility element, which was slowly increasing in the 1980s but subsided in the early 1990s, before catching up again after 1994. In the twenty years since 1979 this element of flexibility increased by 10%, or just over 0.5% per annum.

Figure 2. Functional elements of labour market flexibility, UK

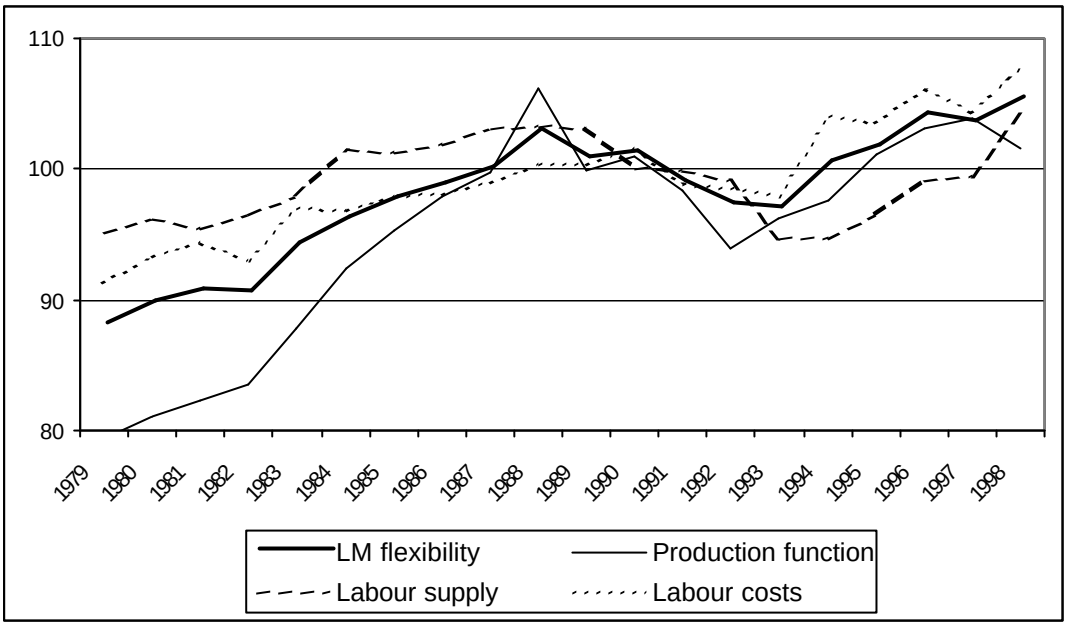


The evolution of the last two elements of flexibility is significantly different. Wage flexibility was stable, if not declining, in the 1980s, fell sharply in the early 1990s, probably as a result of the recession that hit the country in that period, but has since 1994 returned to its 1980s levels. But the most interesting temporal evolution is exhibited by the element measuring internal functional flexibility. Its increasing trend in the 1980s was brought to an end during the recession years. Between 1988 and 1992 internal functional flexibility (i.e., within-jobs occupational mobility) followed a (pro-)cyclical path – which seems directly

related to the turmoil in the labour market at the same period. By 1993 it had returned to its early-1980s levels and continued to fall throughout the 1990s.

Due to these evolutions, the relative importance of the different elements of flexibility also changed. Thus, as one would probably expect, internal numerical and union flexibility became much more significant in the late 1990s. In contrast, increases in other elements of flexibility were much more modest, so that in relative terms such elements became less important. This obviously reflects qualitative characteristics of the type of deregulation supported by the UK governments throughout the period, as well as particular needs that the changing labour market regulations came to serve. It can be argued that the labour market arrangements that became more prominent in the twenty-year period under examination were relating to the need to enhance flexibility inside the workplace, by increasing the adjustability of the labour intake within the firm and reducing the collective voice of workers, mainly through union de-recognition, which was reflected in the declining rates of union membership. Other elements seem much less significant, in that they have increased much slower, if at all. It is not possible to know whether this reflects inefficiencies of the deregulation programme that was followed, or structural factors that are reflected in the behaviour of the firms. Nevertheless, it is probably reasonable to assume the latter, especially given the fact that the deregulation of the UK labour market was to a large extent an across-the-board phenomenon – at least in the 1980s. Although these developments are in line with intuition, the information presented in Figure 2 is very important in that it provides a quantitative measurement of such developments and verifies the conventional expectations. Furthermore, it shows that changes in labour market arrangements have been overall rather smooth with no clearly identifiable structural breaks. In other words, increases in flexibility do not seem to follow immediately after a change in labour market regulations but rather they tend to follow a gradual adjustment procedure.

Figure 3. Aggregate indexes of labour market flexibility, UK



Thus, it seems that the main factor leading to increases in labour market flexibility was related to what we earlier labelled as production-function flexibility. Indeed, this element increased by 28% in the period 1979-1998, exhibiting very fast growth rates especially in the 1980s. As is depicted in Figure 3, the recession of the early 1990s led to a sharp decline in production function flexibility, which took the best part of the 1990s to offset, although the trend growth of this element of flexibility since the mid-1990s is very similar to that prior to the recession. The evolution of labour costs flexibility is rather similar, although the increase is much smoother but also much slower (at 18% or 0.9% annually). Labour costs flexibility was in relative terms much more important in the 1980s than it is today, although in 1998 it was the most prominent element of labour market flexibility. In contrast, labour supply flexibility has lost in relative importance in the 1990s. Whereas this element was increasing in the 1980s, the cyclical behaviour observed for labour mobility in the 1990s resulted in an overall growth for the twenty-year period of 9.5%.

Together, these evolutions are responsible for the picture of overall labour market flexibility that is presented in Figure 3. Labour market flexibility was increasing rather fast (at 1.75% per annum) in the 1980s, that is, during the period of labour market reform under the Thatcher governments. It declined rather sharply (by almost 1% per annum) in the period 1989-1993, which corresponds to a recession period, and returned to its earlier rates of growth (at 1.7% per annum) in the economic recovery since 1993. This cyclical behaviour can of course be quite puzzling at first glance; one could reasonably expect that with increasing labour market flexibility, when the economy was hit by a recession the prevailing pattern would relate to even faster growth of flexible labour arrangements. This is clearly consistent with the view of such arrangements as mechanisms that serve to offset the impact of exogenous shocks to the economy. However, at a more closer look such reservations are less justified. As Figure 2 shows, the impact of the recession was largely absorbed by evolutions across specific elements of flexibility. While functional and wage flexibility were declining, external numerical flexibility, which was pro-cyclical, was increasing rather fast, clearly even faster than the steadily increasing elements of internal numerical and union flexibility. Thus, while the recession affected access to some flexible labour market arrangements (e.g., adjustability of wages, since with above-average unemployment rates wages became less responsive to changes in unemployment) the labour market responded by putting increasing strain in other elements of flexibility which, as discussed earlier, were mainly related to numerical and union flexibility.[15]

[15] This behaviour is very interesting and offers significant insights in the behaviour of the labour market. Without entering into a detailed discussion of this, it is worth noticing that there seems to be some element of substitutability among types of flexible labour arrangements, in the sense that when economic conditions adversely affect elements of flexibility that are exogenous to the firm (e.g., wage flexibility or labour mobility), when the institutional framework allows it, firms will respond by enhancing flexibility in other domains, mainly related to numerical flexibility. Clearly, the opposite reaction is also possible; this is at least not rejected by the negative correlation between wage flexibility and internal numerical flexibility observed in our data.

Two other observations are important here. First, the cyclical behaviour observed is consistent with our definition of flexibility as an observable outcome rather than an only partially realised potential. The above considerations support our decision to follow this definition. By looking at outcomes rather than potentials, it was possible to examine real changes in the quality and extent of flexible arrangements prevailing in the labour market and thus get important insights about the behaviour of the UK labour market during the period under examination and the role of labour market flexibility for the operation and performance of the labour market across the business cycle. Further, it must be noted that the recession of the early 1990s was quite peculiar in that it was rather sector- and region-specific (Martin, 1993). Specifically, while during the recession employment was declining in the south of England, the northern parts of the country were still growing, especially in the service sector, which was the sector most heavily affected in the south. This observation stresses the importance of regional evolutions and it is these evolutions that we turn our attention to next.

(ii) Regional evolutions – flexibility in the UK regions

We saw earlier that different types of flexibility increase faster in different parts of the economic cycle. The same should be also true for changes in different labour markets within the country, for any or all of the following reasons: (a) differences in the regional economic cycles, (b) differences in the regional economic structures and conditions, and (c) differences in the responsiveness to changes in the regulatory framework. The last reason is directly related to specific policy and theoretical considerations. Following the predictions of economic orthodoxy, the UK governments in the 1980s expected that with deregulation flexibility would increase faster in the more rigid labour markets. To the extent that rigidities were associated with poorer economic performance, convergence in labour market flexibility would further translate in regional economic convergence (DTI, 1983). Thus, viewing

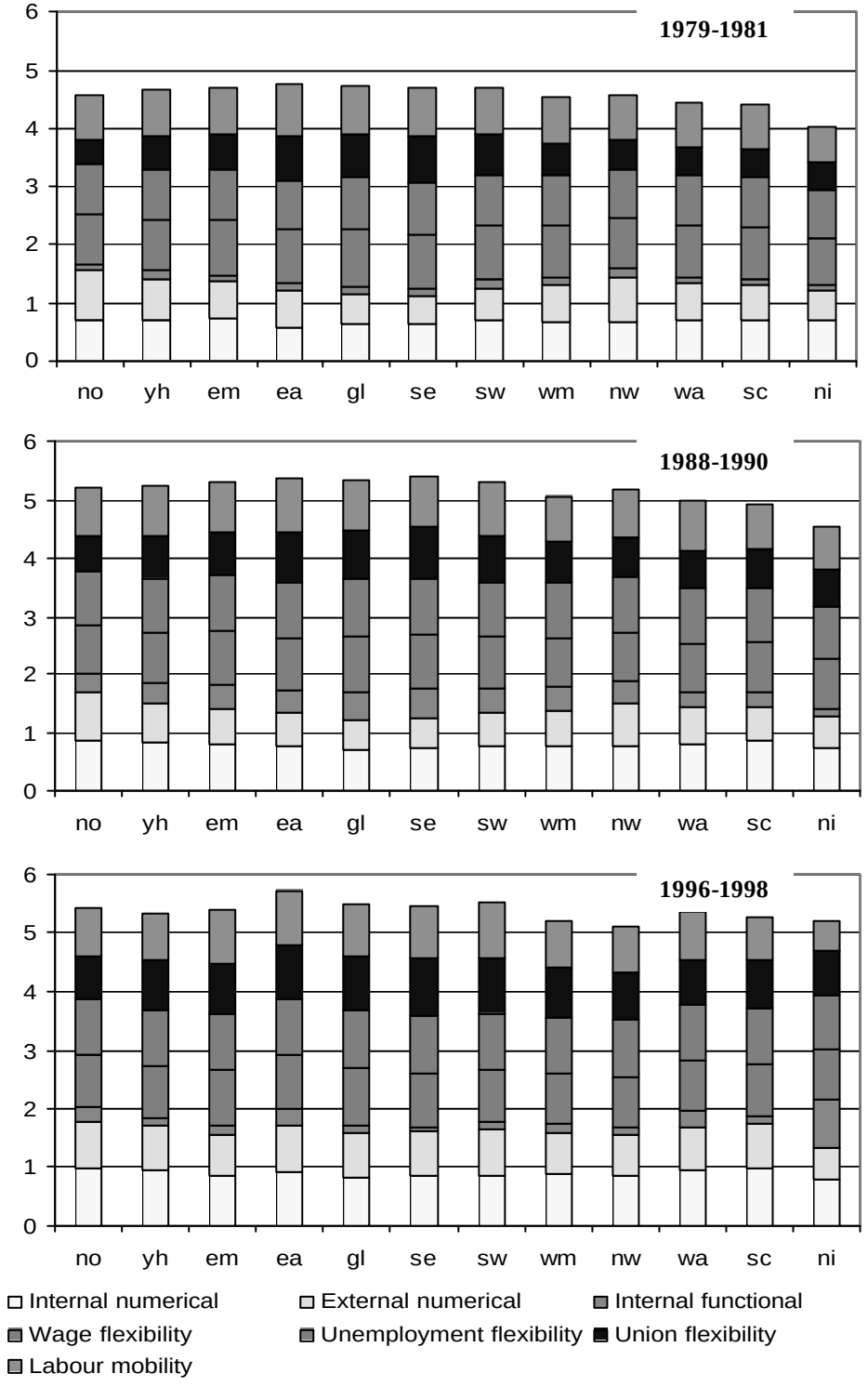
flexibility as a response to economic and institutional changes, it follows that deregulation should create an environment of spatially uneven changes in labour market flexibility. Without entering into a detailed examination of the causes and policy consequences of these changes, we review the evolution of labour market flexibility in the UK regions as illustrated by the indexes that we constructed.

The three panels of Figure 4 summarise the regional performance in terms of the seven flexibility elements across three time periods (1979-81, 1988-90 and 1996-98). As it can be seen regional variations in levels of flexibility seem to be quite small relative to the existing differences across types of elements as reviewed earlier. In the early 1980s flexibility was higher in the south of the country (South East, Greater London, East Anglia, but also South West), with the areas outside England lagging rather significantly behind. Interestingly, in the same period, flexibility types associated with production function flexibility were typically smaller in the south, even in absolute terms.[16] Thus, the flexibility advantage of the south of England in the early 1980s was mostly attributable to structural macro-factors, especially factors related to the elements of union, unemployment, and wage flexibility.

There are few significant changes that can be observed in the late 1980s (second panel). Labour market flexibility increased in all regions, with the more significant increase being related everywhere with internal functional flexibility, probably for reasons discussed earlier. The South East was in the late 1980s the region with the most flexible labour market, enjoying a significant decline in union membership for its workforce. The most rigid labour markets were still outside England, mainly due to factors related to unionism, labour mobility and functional flexibility.

[16] Quite surprisingly, the region with the highest level of overall labour market flexibility (East Anglia) was the one with the lowest level of internal numerical flexibility.

Figure 4. Labour market flexibility in the UK, by region and functional type



By the late 1990s the picture had changed significantly, with the regions exhibiting signs of convergence but also diversity across different types of flexibility. Flexibility increased very fast outside England, mainly the production function element. The south of

England remained the area of highest labour market flexibility, with very high values for union flexibility and labour mobility, although production function flexibility there was still very low (especially internal numerical, despite the fact that it increased by around a half in the twenty-year period; the external numerical element increased even faster and caught up with the rest of Britain). In N. Ireland a substantial increase in internal functional flexibility was combined with persistence (and, hence, divergence) in terms of the other elements of production function flexibility. Consistent with what we saw earlier for the UK as a whole, internal functional flexibility subsided from its late 1980s level in all regions.

Figures 5-8 offer a clearer illustration of these temporal and spatial evolutions for the aggregate measures. As depicted in Figure 5, production-function flexibility was initially higher in the north of England and, despite some signs of relative convergence in the middle of the period, in the late 1990s this element of flexibility was largely dominant outside the South East, the North West and the Midlands. The picture for labour-costs flexibility (Figure 6) is clearer, with the south of England being more flexible throughout the period and Scotland being the only region to exhibit strong signs of convergence. Rather similar is the picture for supply-side flexibility (Figure 7). Labour mobility is lower outside the south of England both at the early 1980s and the late 1990s, despite some signs of convergence in the late 1980s. Putting together the regional pictures of the three aggregate flexibility indexes, Figure 8 presents the evolution of overall labour market flexibility. Clearly the picture throughout the 1980s suggest a standard North-South divide pattern. Despite the fact that the UK regions seem to converge in the late 1990s, this pattern of North-South inequality largely persists.

Figure 5. Production-function flexibility in the UK regions

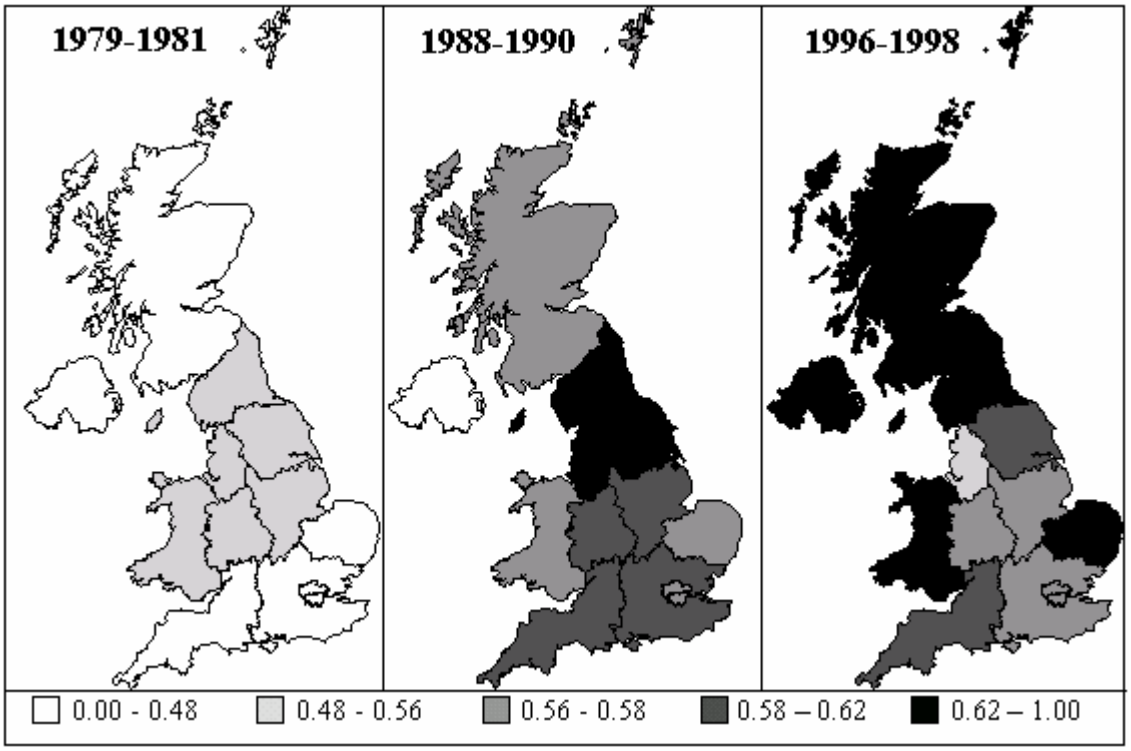


Figure 6. Labour-costs flexibility in the UK regions

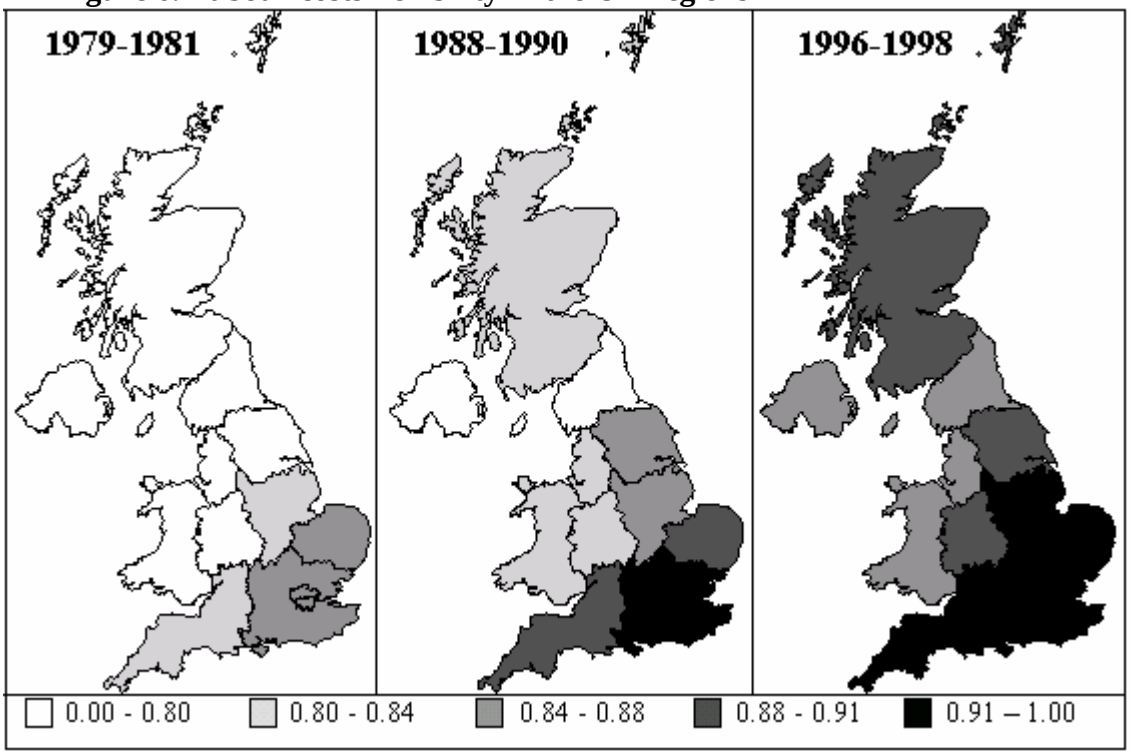


Figure 7. Supply-side flexibility in the UK regions

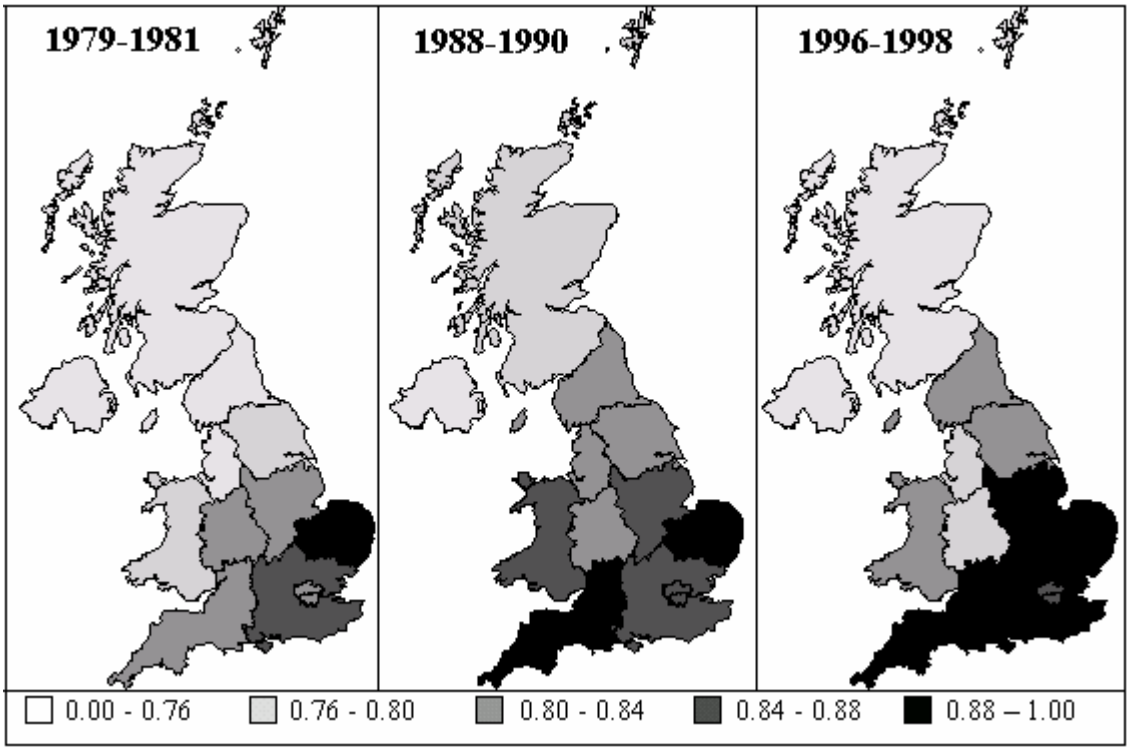
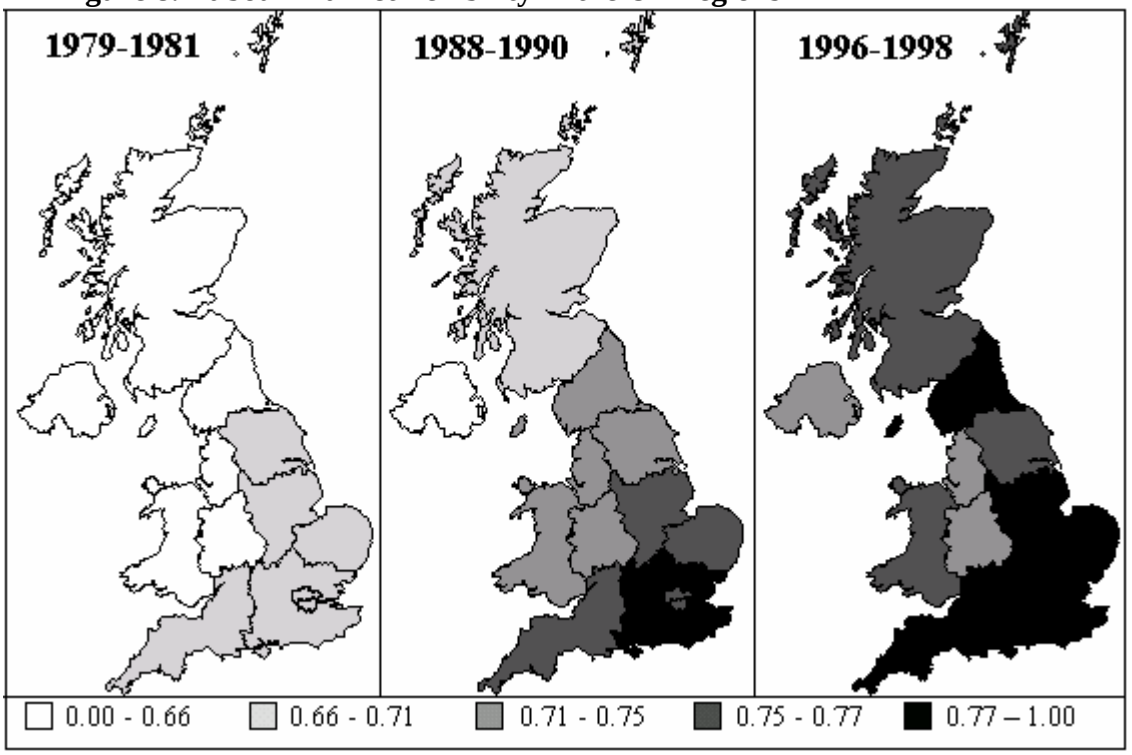


Figure 8. Labour market flexibility in the UK regions



To sum up, the regional patterns revealed in Figures 4-8 seem to suggest that the south of England had throughout the period the highest levels of labour market flexibility. Inequalities related to elements of production-function flexibility remained rather stable, if not increased, despite the fact that the external numerical element showed signs of convergence. Regional disparities in supply-side flexibility were rather stable in the 1980s but increased fast in the 1990s. On the other hand, disparities in labour-cost flexibility declined throughout the period. Thus, regional levels of overall labour market flexibility followed a convergent path especially since the mid-1980s. The general pattern that can be identified through these evolutions shows the south of England to specialise in supply-side and labour-costs flexibility, with many areas in the rest of the UK exhibiting a relative specialisation in production-function flexibility. If anything, this pattern does not seem to lend support to the view of flexibility as a spatially and qualitatively uniform phenomenon. In accordance with at least one interpretation of the expectations of regional policy, deregulation facilitated regional differentation in levels of flexibility. Furthermore, the strong patterns of regional specialisations in functional types of flexibility suggest that structural factors play a significant role in influencing the quality, extent and type of flexible labour arrangements that prevail in each regional economy. Such factors could be related to regional economic specialisations (e.g., industrial composition), socio-economic structures (e.g., skill levels), or even external forces, like transport infrastructure, openness to trade, and globalisation, but the examination of such potential influences runs outside the scope of the present study.

V. Concluding remarks

Measuring, over a twenty-year period, a number of elements that together comprise what is commonly understood as labour market flexibility, the present analysis has allowed a detailed examination of the evolution of flexible arrangements in the UK national and

regional labour markets. Our analysis at the national level revealed some interesting facts that largely seem to be in accordance with expectations. Labour market flexibility increased more or less throughout the period. This increase was rather smooth, with no significant structural breaks, thus suggesting a relative hysterisis in the temporal evolution of labour market flexibility. Despite the upward trend, not all elements of flexibility moved in the same direction at all times. Rather, some evidence of substitutability was also found.

Turning our attention to the regional evolutions, it is noticeable that despite the differences labour market flexibility increased in all regions and, possibly with the exception of N. Ireland which has a much more rigid labour market, differences between the south and the rest of Britain have, if anything, declined. Convergence, although slow, has been identified in the cases of labour-costs flexibility, supply-side flexibility, and some elements of production-function flexibility.

On the other hand, the most interesting observation was that, despite the common temporal evolutions, there exist persistent regional differences in the levels and types of labour market flexibility. The south of England shows higher levels of wage flexibility and labour mobility. Conversely, production-function flexibility is higher in the rest of Britain. Thus, rather than the south being more flexible compared to the rest of the country, it seems likely that different regions within the country utilise – or are driven to exploit – different types of labour market flexibility.

Significant implications for policy stem from this observation. If, as is perfectly plausible, regional differences in labour market flexibility are structural, in that regions of different economic (and social) structures differ in their intensity of use of the various forms of flexible labour relations, then it follows that labour market deregulation is not regionally neutral in terms of the levels and types of flexibility and thus the type of employment relations that it produces. Such a rationale would suggest that the design of labour market

deregulation (and re-regulation) policies must obtain a regional focus, at least to the extent that regional cohesion and harmonisation is within the targets of national economic policy.

It is important that further research is undertaken to explore this issue in more detail. By attributing specific developments of labour market flexibility to specific labour market (economic) and wider social conditions, research can inform policy not only about the necessity of a regionally focused labour market regulation programme, but also of the specific regional variations that such a programme can take so as to optimise its economy-wide effects. Future research could focus – together with extending and probably improving the indexes presented here – on the social, economic, and technological determinants of labour market flexibility, examining the factors that influence on the quality and quantity of flexible arrangements that prevail in the labour market. Additionally, of course, future research should examine in detail the extent and ways in which the spatio-temporal evolutions examined here have impacted on labour market and overall economic performance both at the national and the regional level.

APPENDIX

1. Construction of the wage flexibility indicator

Measures of wage flexibility are typically estimated as the wage elasticity of unemployment, using a standard Phillips-curve equation (Layard et al., 1991; Blanchflower and Oswald, 1994). Wage growth is regressed on unemployment and expected inflation (usually inflation lagged one period) and the coefficient of unemployment is interpreted as a measure of wage flexibility. This standard procedure, however, can only produce a time-series of coefficients (when derived from cross-sectional regressions for each year) or a simple cross-section of coefficients (when derived from time-series regressions for each region). For the purposes of our research, it was necessary to obtain a panel of such coefficients, corresponding to each observation in our sample. To do so, one possibility would be to estimate the cross-sectional and time-series Philips curves (12 time-series, one for each region in our sample, and 20 cross-sections, one for each sample year), thus deriving one wage flexibility measure for each year and one for each region, and then to calculate the average of the two wage flexibility measures corresponding to each observation. The problem with this procedure is that estimates for the wage elasticity of unemployment often vary significantly between cross-sectional and time-series regressions. Averaging may therefore produce values that are artificially constructed and do not correspond to the specific conditions characterising the specific region at the specific year.

Instead, we used an alternative procedure, based on the inverse of individual contributions. We first estimated a Phillips-curve equation for the whole panel of our data (240 observations). We then re-estimated the same regression 240 times, each time dropping one single observation (corresponding to a specific region for a specific year). For each of the 240 obtained coefficients, we calculated the ratio of this coefficient to the one obtained from the full sample. We then subtracted these ratios from unity and obtained a new panel of coefficients. These coefficients measure the percentage change in overall (average) wage flexibility when a specific observation was excluded. Hence, this measure is rather relative (to the universally mean value) than absolute.

To illustrate this procedure better, an example can be used. The universal estimate of wage flexibility was –0.2 (which is slightly over but in line with wage flexibility estimates obtained elsewhere; see for example, Blanchflower and Oswald, 1992; Abraham, 1996; Baddeley et al., 1999). Assume that excluding the value for London in 1990 resulted in a new

estimate of –0.21. This would mean that, when not taking into account the specific situation of London 1990, the estimated wage flexibility increases. We can roughly interpret this as evidence that London in 1990 had less flexible wages than all the regions throughout the period under investigation, on aggregate. It is further possible to quantify this difference. By calculating

$$WFLEX_{L90}=(WFLEX_{TOTAL}-WFLEX_{excl.\{L90\}})/WFLEX_{TOTAL}$$

we obtain 1-(0.21/0.20)=1-1.05=-0.05. Therefore, wage flexibility in London in 1990 was by an estimated value of 5% lower than the average value for our full sample. We attached the value of 0.95 (=1+$WFLEX_{L90}$) to the corresponding observation. This procedure is intellectually appealing and produces quite plausible results (flexibility varies among the 12 regions over the 20 years period from 95% to 113%).

2. Construction of aggregate indexes with missing values

For the calculation of the aggregate (intermediate) indexes in the cases where there were missing values for some of their components, the following procedure was employed, which we illuminate using the case of external numerical flexibility (temping and part-timing). First, we projected the missing (in our example, temping) data backwards, assuming the same time-trend (that flexibility was growing during the missing years at the same pace as it was growing inside the sample years) and the same trend of regional convergence/divergence in terms of levels of flexibility (temping in this case). We then calculated a temporary index of external numerical flexibility, as the un-weighted sum of all the detailed indicators. Further, we calculated correlation coefficients between this temporary index and the full series (part-timing), one for the period for which all data were available and a second for the period for which we undertook the extrapolation. We then created the ratio (k) of the two correlation coefficients (smaller over greater, in absolute terms) and used this ratio as a weight, multiplying the extrapolated series of the aggregate index with k and the original part-timing series (for the same period) with 1-k and adding the two products. This resulted in a series (for the "extrapolated" period) which was closer to the behaviour of the original part-timing data the more our extrapolation produced a correlation that was further away from the one in the "actual" sample.

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